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REVIEW OF THE DRAFT REMEDIAL INVESTIGATION/FEASIBILITY STUDY REPORT IR SITE 35, AREAS OF CONCERN IN TRANSFER PARCEL EDC-5, ALAMEDA POINT, ALAMEDA, CALIFORNIA, DATED JULY 2006.

Dear Mr. Macchiarella:

The Department of Toxic Substances Control (DTSC) has reviewed the "*Draft Remedial Investigation/Feasibility Study Report for IR Site 35, Areas of Concern in Transfer Parcel EDC-5, Alameda Point, Alameda, California,*" dated July 2006 (Site 35 RI/FS). The Site 35 RI/FS was prepared by Bechtel Environmental Inc., (BEI) for the U.S. Department of the Navy, Naval Facilities Engineering Command, Southwest Division (Navy).

The Navy is in negotiations to transfer property at Alameda Point for redevelopment. Transfer Parcel EDC-5 has been identified for early transfer. IR Site 35 consists of the following 23 Study Areas within Transfer Parcel EDC-5:

- 19 areas of concern (AOCs), 17 of which required additional sampling (AOCs 1, 2, 3, 5, 6, 8, 9, 10, 12, 13, 17, 18, 20, 21, 23, 24, and 25) and 2 of which were determined to have sufficient data to perform baseline human-health risk evaluations (AOCs 4 and 7)
- 2 data gap areas: AOC 1/ Environmental Baseline Survey (EBS) Parcels 78-79 and EBS Parcel 205
- 1 solid waste management unit study area that includes seven above ground storage tanks, one oil/water separator, and one underground storage tank

- 1 polynuclear aromatic hydrocarbon (PAH) area, which includes former AOCs 14, 15, 16, and other PAH-only areas across IR Site 35.

The draft RI/FS report for IR Site 35 was prepared to conform to the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act Section 120(h) for closing military bases. To facilitate the early transfer, the RI/FS for IR Site 35 was performed on an accelerated schedule. The RI was performed in accordance with the document entitled *Final Work Plan for Remedial Investigation for IR Site 35, Areas of Concern in Transfer Parcel EDC-5, Alameda Point, Alameda, California* prepared by Bechtel dated January 2006. The purpose of the RI is to characterize the nature and extent of contamination in soil and groundwater at IR Site 35 and to assess risk to human health. The purpose of the FS is to develop and evaluate remedial action alternatives at IR Site 35.

Attached comments are summarized from internal comments submitted to me by the DTSC Geological Services Unit, Engineering Services Unit and the Human and Ecological Resources Division.

If you have any questions, please contact me at (916) 255-6449 or by e-mail at dlofstro@dtsc.ca.gov.

Sincerely,

Dot Lofstrom, P.G.
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Attachment

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Attachment
DTSC Comments on the Draft Remedial investigation/Feasibility Study Report IR Site 35, Areas of Concern in Transfer Parcel EDC-5, Alameda point, Alameda, California, dated July 2006.

GENERAL COMMENTS RELATED TO METALS IN SOIL AND BACKGROUND

1) The Department of Toxic Substances Control (DTSC) does not accept the Oakland Hills Great Valley Complex as the proposed source of fill material with inorganic element concentrations in excess of the 'pink', 'yellow or 'blue' Alameda Point background concentrations, as described in Section 4.3.1.2, page 4-18. Detailed description of analysis completed by DTSC Human and Ecological Risk Division (HERD) for this proposal can be found in the HERD memorandum dated June 26, 2006 reviewing the *Draft Soil Remedial Investigation Report for IR Site 31* and the HERD memorandum dated May 31, 2006 reviewing the *Draft Soil Feasibility Study Report IR Site 30.* In addition, based on discussion at an Alameda Point meeting on August 24, 2006 regarding 'ambient' concentrations for IR Site 30 and IR Site 31, it was our understanding that the Great Valley Complex was no longer being proposed as a source of fill material for Alameda Point IR Sites 30 and Site 31. Therefore, it is inconsistent to propose the Great Valley Complex as the source of fill material for sites located within IR 35.

2) The description of the history of the development of the Alameda Point 'ambient' fill concentrations (Section 4.3.1, page 4-14) contains an inaccuracy regarding DTSC participation. The Alameda Point background data set sample locations were not agreed upon with the regulatory agencies, as stated in the text. The samples results which entered into the development of the 'pink', 'yellow' and 'blue' estimates of Alameda Point fill ambient were selected by the Navy consultant, based on the fill history, iron concentration and manganese concentration (PRC, 1997; Tetra Tech, EMI, 2001) and presented to the U.S. Environmental Protection Agency (EPA)Region 9 and DTSC as a *fait accompli.* The DTSC HERD has repeatedly stated in comment memoranda that these estimates of inorganic 'ambient' have not been approved, while repeatedly requesting an electronic copy of the original 'pink', 'yellow' and 'blue' data sets to perform an independent analysis. HERD received an electronic copy of the 'pink', 'yellow' and 'blue' soil sampling data when requested as part of the review of the Final Closure Report for Industrial Wastewater Treatment Plant (IWTP) 32 (Shaw, 2005) in September, 2005. HERD forwarded the results of the initial independent review of the inorganic element concentrations of the 'pink', 'yellow' and 'blue' data sets in the June 12, 2006 HERD memorandum to Dot Lofstrom dated June 12, 2006. The phrase "...were agreed upon with the regulatory agencies," must be removed from the text.

3) The proposed Preliminary Screening Criterion (PSC) cannot be used as a 'bright line' criterion (Section 3.5, page 3-7) where Contaminants of Potential Concern

(COPCs) are dropped from further analysis when their specific concentration (e.g., maximum or 95 percent upper confidence limit on the mean [95UCL]) does not exceed the applicable PSC. Use of a 'bright line' selection criterion does not account for possible additive cancer and/or non-cancer effects. Past Alameda Point Human Health Risk Assessment (HHRA) methodology has used one-tenth (0.1) of the applicable PSC, providing that no more than 10 COPCs are dropped (HERD memorandum to Mary Rose Cassa dated October 29, 1998). HERD is currently negotiating use of one-twentieth (0.05) the applicable PSC for Department of Defense (DoD) sites. However, those discussions have not reached a consensus. Certainly, COPCs which are orders of magnitude less than the applicable PSC will present minimal risk and/or hazard. A comparison table presenting the IR Site 35 concentrations, the applicable PSC, the ratio of the IR Site 35 concentration to the applicable PSC and any COPCs recommended to not be carried forward in the HHRA must be presented in the detailed HHRA appendix for HERD review (Appendix J) and referenced in the main text. This comparison table should also indicate the Frequency of Detection, the Reporting Limit (RL), and provide a qualitative indication of historic use at Alameda Point.

4) A subset of IR Site 35 soil samples is designated as 'soil type A' based on concentrations below the inflection point of a cumulative frequency plot (Section 4.3.1.1, page 4-16). A significant fraction of the 'pink' ambient data set samples for the inorganic elements were reported as non-detect or estimated 'J-qualified':

	% Detects in 'pink' dataset	% Detects and J-qualified in 'pink' dataset
Aluminum	65.45	100
Arsenic	63.64	81.82
Barium	60.0	100
Chromium	54.55	100
Cobalt	65.45	87.27
Copper	85.45	94.55
Iron	65.45	100
Lead	78.18	92.73
Manganese	70.91	100
Nickel	85.45	100
Vanadium	80.00	100
Zinc	90.91	98.18

Please state whether one half the reporting limit is a surrogate value applied to samples reported as non-detect in these cumulative frequency plots, as was done for the Area of Concern (AOC) 23 statistical tests (Appendix H, page H-2). Also indicate the samples for which a surrogate value was utilized in the cumulative frequency plot figures. Please investigate whether the slope change in the cumulative frequency plots occurs in the concentration range which bridges the non-detected samples, which had surrogate values substituted ('soil Type A'), and the samples with reported concentrations ('soil Type B').

5) The RI/FS report presents a statistical analysis of a combined IR Site 35 sitewide data set for metals in soil and concludes that all metals in soil (except lead at two AOCs) are naturally occurring. It is not surprising that many samples collected from IR Site 35 and analyzed for metals have metals concentrations that represent background, and that the probability plots for both data sets appear, in some ways, to be similar. However, several outliers were removed from the probability plots for the sitewide data set. Further evaluation of the outliers was not presented. It is not clear, on a site-specific basis, which outliers might be significant.

   Moreover, there are exceptions to the assumption that metals concentrations are highly correlated within samples, as discussed in specific comment #3 in the section below. Without a site-specific evaluation of all metals that are above background, there is uncertainty as to whether or not site-related metals contamination exists. This reduces the confidence in the determination that metals have been adequately characterized and that no further action is required.

   The discussion for each site within IR Site 35 should include an analysis of the frequency of detection of metals above Alameda Point background, regardless of the PSC, to increase the confidence in the conclusions regarding whether or not metals are naturally occurring. Additional statistical methods should be used to evaluate outliers such as histograms, box plots, and univariate plots.

6) All three Tier I exposure groups evaluated exposure to inorganic elements 'below background' (Section 6.1.2.3, page 6-3). Metals were included in the Tier I list of COPCs regardless of whether the concentrations were above or below the Alameda Point 'pink' 95 UCL. HERD comments contained in this attachment regarding the impact of 'background' in the more detailed HHRA performed for sites other than those with a simple Tier I analysis are not, therefore, applicable to the Tier I methodology or results.

SPECIFIC COMMENTS RELATED TO METALS IN SOIL AND BACKGROUND

1) Section 4.1.5 – Metals. This section provides a discussion and presentation of only those metals that exceed both the PSC and Alameda Point background. Based on this information, uncertainty remains as to whether or not site-related metals contamination exists. A site-specific evaluation of metals above Alameda Point background should be completed, regardless of the PSC, and included in the RI/FS report.

2) Section 4.3.1.1 – Statistical Analysis of IR Site 35 Soil Data. The validity of the statistical analysis provided in this section is in question for the following reasons:

   i. A combined data set for all AOCs does not provide sufficient detail to evaluate outliers on a site-specific basis. Inappropriate pooling of datasets is not recommended, thereby decreasing the reliability of the statistical evaluation. An area-by-area statistical evaluation is recommended for those sites with sufficient metals data.

   ii. For the probability plots presented in Appendix H, extreme outliers are removed from the data set without an evaluation as to whether or not the outliers are significant and indicative of site-specific contamination. Additional analysis such as univariate plots should be used to evaluate the spatial distribution and significance of outliers.

   iii. Interpretation of populations in probability plots is subjective. The Navy should provide histograms and/or box plots to support the interpretations presented in this section.

   iv. The determination of two populations (designated soil types A and B) is not supported by the probability plots for key metals that are known or suspected contaminants at Alameda Point (such as arsenic, chromium, cobalt, copper, and nickel).

   v. Scatter plots presented in Appendix H do not show compelling correlations for several metals which are known or suspected contaminants at Alameda Point.

3) Section 4.3.1.1 – Correlation of Concentrations in Fill Soil with Off-Site Sources. Section 4.3.1.1 asserts that a qualitative analysis supports the conclusions that metals identified at IR Site 35 are likely the result of natural processes rather than site-related activities. DTSC disagrees that the "qualitative" analysis

presented in this section is supportable. For example, the IR Site 35 median concentration for cobalt in soil is 4 milligrams per kilogram (mg/kg). However, the highest value detected in soil samples collected from IR Site 35 is 259 mg/kg. This elevated concentration of cobalt may be related to a site-specific release at AOC 2. In addition, at AOC 12, three soil samples were found to contain elevated arsenic concentrations that are represented as site-related. However, the analysis presented in this section fails to identify these outliers. The analysis has limited usefulness because it may fail to identify other potentially site-related metals in soil at IR Site 35. Therefore, the Navy should perform a site-specific evaluation of metals above Alameda Point background values.

4) Section 4.3.1.1, page 4-16. A statistical test should be performed to determine whether the IR Site 35 soil concentrations are statistically significantly different from the 'pink' Alameda Point data set after the IR Site 35 samples for which a surrogate value may have been substituted are determined. This approach is recommended rather than relying on a comparison of percent of samples greater than some estimate of the central tendency, such as median or 95UCL.

5) Section 4.3.1.1, page 4-17. Barium is proposed as a 'common' inorganic element which might be useful in correlation analysis to identify releases because barium has 'not been associated with Navy activities.' Barium nitrate ($BaNO_3$) is used in signal flares and barium titanate ($BaTiO_3$) is used as a dielectric in capacitors (**http://education.jlab.org/itselemental/ele056.html**), both of which conceivably are associated with Navy activities. The selection of any element other than aluminum or iron for soil concentration correlation analysis must be discussed with the DTSC HERD prior to incorporation into the IR Site 35 RI/FS Report.

6) Section 4.3.3, page 4-25. DTSC does not agree that the correlations reported on Table 4-13 for many of the inorganic elements are sufficiently strong to be of use in support of the conclusion that there has been no release. A statistical test against the Alameda Point 'pink' inorganic element data set coupled with an analysis of the geographic pattern of the relatively elevated concentrations in IR Site 35 samples must be completed. This is particularly critical for evaluation of the potential health effects associated with manganese which occurs at concentrations in excess of the 'pink' Alameda Point 'ambient' concentration. The manganese toxicity reference value (RfD) is based on human exposures with minimal uncertainty factors.

7) Section 4.3.3, page 4-25. Discussions or demonstrations of the weathering of common rock types as a greater source of 'overall mass flux of metals' into the environment' is not pertinent to the HHRA. The risk assessment methodology attempts to present estimates of the incremental cancer risk and/or non-cancer hazard associated with elevated concentrations of carcinogens or non-carcinogens. The critical risk management decision, which relies on 'ambient' concentrations, is whether any increase in risk and/or hazard is sufficiently great to require evaluation of remedial alternatives. The significant HHRA-related question for inorganic elements, which can be resolved by following the steps outlined in Specific Comment Number 6 above, is whether IR Site 35 concentrations are in the range of, or exceed, Alameda Point 'ambient'. Please provide the statistical tests and geographic assessment requested.

8) Appendix H- Background Comparison. DTSC does not agree that bi-coordinate plots of aluminum against ten inorganic elements demonstrate a 'strong correlation among the metals and aluminum' (Appendix H, page H-1). One categorization of the strength of a correlation (r) (Franzblau, 1958) is:

Strength of correlation	Lower Category Bound (r)	Upper Category Bound (r)
No or negligible correlation	0	0.2
Low degree of correlation	0.2	0.4
Moderate degree of correlation	0.4	0.6
Marked degree of correlation	0.6	0.8
High correlation	0.8	1.0

A more general statement of the lower bound strength of a correlation (r) (Hinkle, et al., 1988) is that correlations less than 0.30 indicate little if any relationship between variables. DTSC HERD generally considers correlations in which more than 50 percent of the variance in one component is accounted for by the variance in the other variable (i.e., $r>0.7$ or $r^2>0.50$) as useful in the site characterization necessary for a risk assessment. Using the 50 percent variance criterion, the following shaded correlations (Table 4-13) would be considered sufficiently strong to be considered in the discussion of background as it impacts the HHRA:

IR 35 Sites Table 4-13 Inter-element correlations		
	Al Correlation (r)	Fe Correlation (r)
Aluminum	1.0	0.92
Arsenic	0.64	0.74

Barium	0.51	0.66
Chromium	0.65	0.58
Cobalt	0.64	0.83
Copper	0.79	0.80
Iron	0.92	1.00
Lead	0.39	0.36
Manganese	0.68	0.80
Nickel	0.59	0.53
Vanadium	0.87	0.89
Zinc	0.66	0.68

The variance among the strength of these correlations would indicate that there was no single source for the IR Site 35 soil samples analyzed. The statistical test of IR Site 35 soils samples against the 'pink' background data set outlined in Specific Comment 11 above should be performed to determine if IR Site 35 soils exceed Alameda Point 'ambient'. Discussion of the range in strength among the inter-element correlations should be part of the future discussions of 'ambient' for IR Site 35.

9) Attachment B AOC 2, Section 4.1.5 – Metals. The comparison of metals concentrations at AOC 2 to PSCs is not supported in the text to determine whether metals are site-related or naturally occurring. For example, cobalt was detected in the sample from 1 foot below ground surface (bgs) at soil boring A02SB02 at a concentration of 259 mg/kg. Other metals were not detected above background in this sample. This site-specific outlier, and any others, should be discussed. The evaluation of metals should be revised to include a discussion of metals above Alameda Point background values, and not be limited to just those values above PSCs.

10) Attachment B AOC 2, Section 5.3 – Contaminant Migration. DTSC does not concur with the Attachment B determination that metal concentrations above PSC values and Alameda Point background values are naturally occurring without further site-specific analysis of metals data. The conclusion that the metals in soil contributing to human health risks are naturally occurring, and therefore require no further action, cannot be supported without additional site-specific evaluation. This comment also applies to the following sections:

- Attachment E AOC 5, Section 7.2 – AOC 5 Conclusions and Recommendations.

- Attachment L AOC 12, Section 7.2 – AOC 12 Conclusions and Recommendations (refers to thallium, vanadium, and iron).
- Attachment R AOC 23, Section 4.1.5 – Metals.
- Attachment R AOC 23, Section 7.2 – AOC 23 Conclusions and Recommendations (refers to metals in soil and groundwater).

11) Attachment E AOC 5, Section 4.1.4 – Metals. The discussion of metal concentrations includes only those metals that were found to exceed both background values and the PSC values. The comparison of metal concentrations to PSC values does not provide sufficient information to determine whether metals are site-related or naturally occurring. The Navy should present and discuss all metal concentrations detected above Alameda Point background values to provide greater confidence in the determination as to whether or not a release has occurred.

12) Attachment K AOC 11/EBS Parcels 78-79, Section 4.1.5 - Metals. The discussion of metals includes only those metals that were found to exceed both background values and its respective PSC values. The comparison of metal concentrations to PSC values does not provide sufficient information to determine whether metals are site-related or naturally occurring. The Navy should present and discuss all metal concentrations detected above Alameda Point background values to provide greater confidence in the determination as to whether or not a release has occurred.

13) Attachment L AOC 12, Section 5.1 – AOC 12 Conceptual Site Model. The RI report states that metals other than lead are believed to be naturally occurring. However, arsenic was found at concentrations more than two to three times the background value in samples collected along the railroad tracks, and thallium which was detected in soil above the PSC, does not have a background value established for Alameda Point. The soil samples with elevated arsenic concentrations were not found to contain other metals above background. The soil samples with elevated thallium concentrations were found to contain several metals above background values, but arsenic was not detected in these samples. While it is understood that arsenic is addressed with lead in the FS, it remains unclear whether or not other metal contaminant impacts occur at AOC 12 above background values. The Navy should perform a site-specific evaluation of metals focusing on exceedences of the Alameda Point background data set.

14) Attachment S AOC 24, 4.1.4 – Metals. Most of the metals found in soil at concentrations above background values were from the sample collected from

five to six feet bgs. Several metals were reported above background values in this sample. While this may support the conclusion that metals in this sample are naturally occurring, a discussion of this finding should be provided in the report.

SPECIFIC COMMENTS RELATED TO GROUNDWATER

1) Section 1.5.10 – Basewide Groundwater Monitoring Program. The Navy should verify the information provided in this section with respect to the monitoring schedule of wells MBG-1 and 398-MW1. It is unclear whether the Basewide Groundwater Monitoring Program (BGMP) includes these wells on a quarterly schedule.

2) Section 1.6.2.2 – IR Site 4. The Navy should indicate that the groundwater contamination emanating from dense nonaqueous-phase liquid (DNAPL) sources at IR Site 4 is comprised predominantly of TCE, 1, 1-dichloroethylene (1, 1-DCE), and related breakdown products (i.e. cis-1, 2-DCE and vinyl chloride).

3) Section 1.6.2.9 – IR Site 21. Data from the OU-2B RI indicate that a release of chlorinated solvents has occurred in the vicinity of the northeast corner of Building 398, approximately 100 feet west of the AOC 23 site boundary and well 398-MW1. Chlorinated solvents detected in this area include 1,1,1-trichloroethane (1,1,1-TCA), 1,1-dichloroethane (1,1-DCA), TCE, PCE, and cis-1,2-DCE. The Navy should verify that there is a chlorinated solvent plume in this area of IR Site 21 that possibly contributed chlorinated solvents to groundwater at well 398-MW1.

4) Section 2.5.2.2 – Groundwater Flow Direction and Gradient at IR Site 35. The first bullet on page 2-10 states that localized groundwater flow direction is influenced by groundwater extraction at IR Site 5 and by groundwater mounding at IR Site 3. DTSC is unaware of any groundwater extraction occurring at IR Site 5. Also, the probable cause of the groundwater mounding at IR Site 3, an area of known DNAPL contamination, is not provided in the RI. The Navy should explain the cause of the mounding and also include the groundwater elevation data for well 398-MW1 on Figure 2-11, if available.

5) Section 4.3.2, page 4-19. A comparison of the groundwater 'background' dataset to the IR Site 35 groundwater dataset similar to that performed for the IR Site 35 soil data set should be performed for those groundwater elements which are dropped from the HHRA based on the 'naturally occurring' argument (Section 5.2.2, page 5-15).

6) Section 4.4.2, page 4-26. The summary of the groundwater COPCs exceeding PSCs for a small number of exceedances should also indicate the total number of groundwater samples. Thus, rather than stating "two exceedances of 1, 2-DCA," the RI should state that there were, "two exceedances of 1, 2-DCA in 8 groundwater samples."

7) Section 4.4.2, page 4-27. Benzo (a) pyrene at AOC 23 above the PSC in groundwater is dismissed as 'not expected to be dissolved in groundwater' without any discussion of co-solvents such as benzene which were detected in groundwater at AOC 23. Further discussion of the potential effect of co-solvents on PAH groundwater concentrations should be included.

8) Section 4.4.2, page 4-27. A deed restriction on the use of groundwater is likely to be necessary for locations such as EBS Parcel 205, where presence of organic compounds in groundwater is considered 'not significant' based on the assumption that it is 'unlikely' that groundwater would be used for drinking water rather than presenting a risk-based analysis.

9) Section 4.1.1 – Volatile Organic Compounds. The RI states that the concentrations of two detections of 1, 2-DCA in groundwater were above the PSC in the eastern portion of AOC 23 and are likely associated with Corrective Action Area (CAA)-3A. However, chlorinated solvents, such as 1,1,1-TCA, have been found in groundwater in the vicinity of the northeast corner of Building 398 at IR Site 21, located approximately 100 feet east of AOC 23. Trace levels of chlorinated hydrocarbons (1, 2-DCA, TCE, and PCE) were reported in groundwater samples collected from well 398-MW1 in AOC 23. It is possible that the source of the 1,2-DCA in groundwater at AOC 23 may be related to chlorinated solvent sources at IR Site 21, and is not necessarily related to the petroleum contamination at CAA-3A. DTSC recommends that the Navy include this information in the RI/FS report.

10) Attachment D AOC 4, Section 1.4.1 – Basewide Groundwater Monitoring Program (BGMP). Although the RI states that the BGMP was initiated in 2002 and is ongoing, only groundwater results from 1998 are discussed. The Navy should include a discussion of more recent analytical data from well MGB-1, if available. The Navy should also provide monitoring well MGB-1 construction details or as-built diagram to document total well depth and screen interval.

11) Attachment R AOC 23, Section 2 – Physical Setting. The RI states that groundwater yield at several borings was very low, taking up to two days for

groundwater to recharge so that sufficient sample volume could be obtained. As a result of this slow recharge, volatile organic compound (VOC) data obtained from these sampling locations is likely biased low. DTSC recommends that the Navy flag questionable analytical data for wells with excessive recharge times. This request applies to VOC data for all AOCs in IR Site 35 for which excessively slow recharge was encountered

COMMENTS RELATED TO FATE AND TRANSPORT OF CONTAMINANTS

1) Section 5.2.3 – Mobility of Contaminants. The Navy should specify which data were used to estimate the site-specific average values for bulk density and effective porosity, and indicate how the site-specific averages were derived.

2) Section 5.2.3 – Mobility of Contaminants. The abbreviation "R" is not defined in the footnotes on Table 5-2. Also, it is unclear how the value for R was derived. If distribution coefficient (K_d) was estimated using octanol-water partition coefficient (K_{oc}) and fractional organic carbon (f_{oc}), the site-specific f_{oc} values should be provided. If, on the other hand, published K_d values were used, these should be provided along with the appropriate reference(s).

3) Section 5.3, page 5-16.Please indicate in the text why Solid Waste Management Units (SWMUs) are not included in the evaluation of contaminant migration.

4) Section 5.3.1.2, page 5-17. Release of fugitive dusts is not considered possible for a subset of the IR Site 35 locations based on the presence of paving or landscaping. Some mechanism must be put in place to evaluate this transport pathway should the pavement or landscaping be significantly altered in the future. The same requirement for future re-evaluation should be placed on IR Site 35 locations where the surface water runoff pathway (Section 5.3.2, page 5-18) and the soil to groundwater pathway (Section 5.3.3, page 5-18) are not evaluated based on current pavement or landscaping.

COMMENTS RELATED TO RISK ASSESSMENTS

1) Section 6.5, page 6-16 and Appendix J, Section J8, pages J-68 through J-70. The lead-only site evaluations indicate that soil lead in the 'high-impact' areas, defined as under hardscape, for AOC 10 (Appendix J, Table J8-1) and AOC 12 (Appendix J, Table 8-4) exceed the site-specific health protective lead concentration without home grown produce (322 mg/kg) only in AOC 10. The AOC-wide soil lead concentration is less than the site-specific health protective

lead concentration with home grown produce (184 mg/kg) for both AOC 10 and AOC 12. Future removal of the hardscape with potential residential use of AOC 10 would require further risk management evaluation.

2) Section 7.2, page 7-9 and 7-10. DTSC agrees with the inclusion of AOC 1, AOC 3, AOC 10, AOC 12, AOC 23 and PAH areas in the FS (Section 8 through 11). Based on the site descriptions and the site-specific COPCs, the range of risk and/or hazard for the following sites are within the risk management range, and DTSC supports the recommendation for No Further Action (NFA) only for

   - AOC 6 (polychlorinated biphenyls [PCBs] only),
   - AOC 7 (PCBs only, metals below background),
   - AOC 8 (no metals),
   - AOC 9 (HI<1),
   - AOC13 (primarily chlorinated pesticides),
   - AOC 18 (risk management range cancer risk associated with naphthalene in groundwater) and
   - AOC 21 (cancer risk *de minimis* and hazard index less than 1).

   The proposal for NFA for the remaining areas listed cannot be evaluated until the impact of the use of each PSC as a 'bright line' criterion and IR Site 35 'ambient' issues are resolved.

COMMENTS RELATED TO STORMWATER DRAINS

1) Section 1.6.4.1 - Storm Sewer Lines. The RI states that IR Sites 5, 6, and 7 are the only areas where storm sewer lines traverse groundwater plumes that are located upgradient from IR Site 35, and that these lines are in areas that are marginally impacted by chemicals in groundwater. This statement is based on quarterly sampling data and interpretations presented in the Basewide Groundwater Monitoring Report from spring 2005. However, these data and interpretations are incomplete and cannot be relied upon for this analysis. The following additional information should be evaluated:

There are possible impacts due to historical sources and contaminant distribution that are not represented by the recent sampling data. For example, at IR Site 5, a DNAPL source was present in the vicinity of the storm sewer lines emanating from the eastern central portion of Building 5. The current monitoring well network for some of the IR sites with groundwater contamination does not include wells located in high concentration (source) areas. Therefore, the contaminant distribution is not accurately represented by the current monitoring well network.

Storm sewer lines emanating from areas within IR Site 21 have not been included in the discussion even though these lines traverse areas of known groundwater contamination. Two of the storm sewer segments originating at IR Site 21 pass through the areas of vinyl chloride contamination found at AOC 23.

Potential preferential migration of contaminants from groundwater plumes should be re-evaluated to include a discussion of the historical data from IR sites in source areas that may not be monitored by the current BGMP.

2) Section 5.1.2.3, page 5-5. Sediment traps in stormwater drains in AOC 12 had elevated lead concentrations up to 972 mg/kg and should be cleaned of that sediment.

GENERAL COMMENTS RELATED TO FEASIBILITY STUDY ISSUES

1) The treatment alternatives retained for detailed analysis of alternatives are appropriate for the proposed groundwater treatment remedies. Specifically, these include:
   - Monitored Natural Attenuation (MNA);
   - Enhanced Aerobic In Situ Biodegradation (EA ISB); and
   - In Situ Chemical Oxidation (ISCO).

   However, the detailed analyses of these treatment alternatives are deficient. These deficiencies are described in more detail below.

2) The RI/FS for Site 35 does not contain a reference for the use of modeling in conjunction with site-specific data for the purpose of screening or detailed analysis of alternatives of the MNA treatment alternative. The Final RI/FS should address this issue

   Past feasibility studies from Alameda Point pertaining to MNA have contained at a minimum, the use of Biochlor® modeling as a screening tool to assess the

applicability of MNA to the site being evaluated. In addition, the modeling process was developed using parameters derived from site-specific sample analysis.

The use of Biochlor® modeling is acceptable for the purpose of screening a site to determine if a MNA technology is applicable. However, DTSC has continually recommended the use of a more robust modeling tool for use during the detailed analysis of alternatives in order to assure the choice of an appropriate recommended alternative.

The FS for OU-2B used FSR (SEAM3D) modeling, in conjunction with site-specific data, to analyze this treatment alternative in detail. The DTSC ESU concurred with the use of this type of model as a solution to the past request for more robust MNA modeling in the detailed analysis of alternatives, and requests that the Draft Final RI/FS include similar type of modeling.

3) For both the EA ISB and ISCO alternatives, the development and implementation of treatability studies to assess the applicability of these technologies should be completed in order to adequately conduct a detailed analysis of alternatives for these treatment technologies. The Draft Final RI/FS should contain, at a minimum, results from lab-scale treatability studies in the assessment of the applicability of these treatment technologies.

   The lab-scale treatability studies should be based on the use of soil and groundwater samples obtained from the saturated zones of each specific AOC to be addressed by the relevant treatment technology.

   Specifically, the lab-scale treatability studies should address an evaluation of the multiple ISCO treatment technologies (i.e., Fenton's Reagent (H_2O_2/Fe), Ozone, Permanganate (K/Na), Ozone/H_2O_2) that may be the most appropriate for the specific AOC.

4) The Draft Final RI/FS should contain a more complete cost analysis, one of the most important alternative comparison parameters. The completion of the recommended treatability studies can provide the information to properly develop a cost estimate. The Draft Final RI/FS cost estimates for both soil and groundwater treatment alternatives should contain:

   - A list of the assumptions made in the development of soil and groundwater cost estimates;
   - The method used to develop the cost estimates (i.e., RACER);

- Additional cost detail (i.e., Number of ISCO or EA ISB injection wells/ Related cost, MNA Sentry well/ Related cost) necessary to properly evaluate the estimates.

5) The findings of the initial groundwater investigations may impact decisions for the most appropriate alternative at AOC 1 and AOC 23. Thus, the proposed initial groundwater investigations should be performed prior to selection of the preferred remedial alternative.

SPECIFIC COMMENTS RELATED TO FEASIBILITY STUDY ISSUES

1) Section 7.1.1 – AOC 1. The noncancer hazard index (HI) for napthalene is greater than 1 and the extent of naphthalene is not defined. The Navy should state that these are additional reasons to carry AOC 1 forward into the FS.

2) Section 11.5.4.3 – Effectiveness Sampling for Naphthalene. Since metals may be mobilized to groundwater by the ISCO process, performance monitoring should include analyses for dissolved metals. This comment also applies to Section 11.6.3.3 – Effectiveness Sampling for Vinyl Chloride.

3) Section 11.7.4.4 – Reduction of Toxicity, Mobility, or Volume through Treatment. It is unclear why Alternatives AOC 1-1 and AOC 1-2 rated medium in this category since these two alternatives do not involve any form of treatment.

4) Section 11.7.5.4 – Reduction of Toxicity, Mobility, or Volume through Treatment. It is unclear why Alternatives AOC 23-1 and AOC 23-2 rated medium in this category since these two alternatives do not involve any form of treatment.

COMMENTS REQUESTING ADDITIONAL INFORMATION AND/OR SAMPLING

1) Section 1.5.7.2 – Operable Units 1 and 2 Data Gap Investigation. Contaminants originating from OU-2B that may have impacted IR Site 35 parcels is more extensive than what is listed. The list of contaminants should include TCE, PCE, cis-1, 2-DCE, and 1, 2-DCA

2) Attachment F AOC 6, Section 5.1 – AOC 6 Conceptual Site Model. The RI states that the western extent of PCBs in shallow soil has not been defined but that, based on the direction of the PCB-containing oil spray, concentrations of PCBs in the soil are expected to decrease toward the west. Because the precise

location of the former transformer that ruptured is unknown, and the direction and distance of the spray cannot be verified, confirmation samples should be collected to define the extent of PCBs in soil to the west of borings A06SB02 and A06SB03 where Aroclor 1260 concentrations exceeded the California Human Health Screening Level for soil. This comment is also applicable to Attachment F AOC 6, Section 7.2 – AOC 6 Conclusions and Recommendations.

3) Attachment A AOC 1, Section 7.1 – AOC 1 Conclusions and Recommendations. Attachment A states that the cancer and non-cancerous risks are within the risk management range, if domestic drinking water use of groundwater is not considered. However, a HI of 2 is not within the risk management range.

4) Attachment R AOC 23, Section 4.1.1 – Volatile Organic Compounds. The Navy should:

   - provide the station identifier for the soil sample with vinyl chloride above the PSC.
   - clarify whether the 25 VOC concentrations reported at concentrations below PSC suggest that a source of VOCs exists at AOC 23 that requires further investigation, or whether these VOC concentrations would act as a continuing source of groundwater contamination.

5) Attachment R AOC 23, Section 4.2.1 – Volatile Organic Compounds. The Navy should clarify whether there is a relationship between VOC soil concentration distribution patterns and the pattern of ground water VOC concentrations to indicate a source of VOCs at AOC 23 that would warrant further investigation

MINOR AND/OR EDITING COMMENTS

1) Section 3.5, page 3-8. The frequency of detection for several inorganic elements in the Alameda Point 'ambient' data set is less than 50 percent. Please include the frequency of detection in the tabular representation of the Alameda Point inorganic element concentrations (Table 3-10) referenced in the text.

2) Section 4.3.1.1, page 4-16. The comparison of the median and 95th percentile values in the IR Site 35 and Alameda Point 'pink' background data sets is presented in Table 4-12, not 4-13 as indicated in the text.

3) Section 5.4.3, page 6-15. Please amend the text describing the groundwater sampling event which reported 10 samples with elevated PCB concentrations for AOC 11/EBS Parcels 78-79. The text currently states 'in one possibly anomalous sample containing PCBs in ten samples' rather than one sampling event of ten samples.

4) Section 1.6.2.4 – IR Site 6. Please clarify that AOCs 19 and 22 were removed from IR Site 35 and are being addressed as part of IR Site 6.

5) Section 1.6.2.5 – IR Site 7. Include a brief discussion about the former incinerator and soil debris area at IR Site 7.

6) Section 1.6.2.6 – IR Site 8. Clarify that there was a washdown area and oil-water separator on site that likely contributed to groundwater contamination.

7) Section 1.6.2.11 – IR Site 28. Verify that elevated levels of arsenic approximately 200 to more than 400 micrograms per liter (µg/L) in groundwater at IR Site 28 are not bounded to the south.

8) Attachment A AOC 1, Section 5.3 – Contaminant Migration. Clarify that values estimated for retardation are approximate because they depend on a number of site-specific subsurface parameters that can change appreciably from location-to-location. At many sites, these site-specific parameters have not been measured. The absence of detectable naphthalene in the two other locations sampled at AOC 1 (about 70 feet north and east) may be related to differences in groundwater flow directions and/or migration through preferential flow pathways.

9) Attachment B AOC 2, Section 1.1 Background. The boundary and size of AOC 2 changed between the final RI work plan for IR Site 35 and the draft RI/FS report without rationale or discussion. These changes in site boundary dimensions and size should be addressed.

10) Attachment E AOC 5, Section 1.4.2 – Polynuclear Aromatic Hydrocarbon Removal Action. The RI/FS states that soil in the locations where samples were collected from three borings (K12, L11, and L12) was still in place after the Time-Critical Removal Action, and that these samples were analyzed for PAHs. However, Figure 1-1 shows that samples from soil boring L11 were analyzed for metals only. Appendix B indicates that these samples were only analyzed for arsenic. This discrepancy should be corrected.

11) Attachment F AOC 6, Section 6.2 – Risk Characterization. This section (and the following two sections) state that 15 soil samples from AOC 6 were analyzed for PCBs. However, according to Table 4-1, only 12 soil samples were analyzed for PCBs. The Navy should reconcile and correct this information.

12) Attachment K AOC 11/EBS Parcels 78-79, Section 6.2.1. It is unclear what is considered to be metals background values for the purposes of the risk evaluation. On Table 6-2, which summarizes the human-health risk assessment results, risks associated with arsenic in groundwater are not listed under the "without background" columns even though arsenic was found at concentrations above the 95th percentile background value. The Navy should clarify or reconcile this discrepancy.

13) Attachment R AOC 23, Section 4.2.1 – Volatile Organic Compounds. The RI/FS states that current sampling of well 398-MW1 as part of the RI did not confirm the presence of VOCs above PSC values in this well. However, the data provided on Table 4-10b indicate that the sample obtained from this well during the RI exceeded the PSC value for 1, 2-DCA. This discrepancy should be corrected.

    a. The units provided for TCE concentrations in the last bullet on page R4-8 should be corrected to indicate µg/L, not mg/L.
    b. Contrary to the statement of the last sentence of the first full paragraph in this section, the lateral extent of vinyl chloride is not defined north of the southern exceedence.

14) Attachment P AOC 20, Section 7.1 – Summary. The concentration listed as the maximum contaminant level for arsenic is actually the maximum concentration that was detected in groundwater at this AOC. The Navy should correct this information.

15) Attachment R AOC 23, Section 4.2.1 – Volatile Organic Compounds. The Navy should indicate that the two exceedences of 1, 2-DCA may be related to releases of chlorinated hydrocarbons at Building 398.

REFERENCES

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